



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/618,648	07/18/2000	Joseph E. Geusic	303.382US2	1734

21186 7590 03/21/2002

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. BOX 2938  
MINNEAPOLIS, MN 55402

EXAMINER

LOUIE, WAI SING

ART UNIT	PAPER NUMBER
----------	--------------

2814

DATE MAILED: 03/21/2002

8

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/618,648

Applicant(s)

GEUSIC ET AL.

Examiner

Wai-Sing Louie

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 45-99 is/are pending in the application.
- 4a) Of the above claim(s) 45-90 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 91-99 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,5,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

1. Applicant has canceled all previous claims. Claims pending are 45-99.
2. Newly submitted claims 45-90 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The original claim 1 is for a method of manufacturing a semiconductor device and claim 30 is for an integrated circuit. New claims 91-99 are drawn to an integrated circuit. Therefore, claims 91-99 will be prosecuted in this office action. Claims 45-90 are restrictable.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 45-90 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Claim Objections***

Claims 91-99 are objected to because of the following informalities:

- In claim 91, line 3, "waveguides" should be "waveguide"

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 2814

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 99 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In claim 99, it is not clear what is a "self-limiting deposition process". One would call filling a bottle with water is a self-limiting deposition process, however, the hole in a wafer has no bottom. Please explain how to line a hole with a self-limiting deposition process.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 91-99 are rejected under the judicially created doctrine of double patenting over claims 1-26 of U. S. Patent No. US 6,198,168 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

Art Unit: 2814

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows:

With regard to claim 91, US 6,198,168 discloses an integrated circuit comprising:

- At least one functional circuit formed on a wafer (claim 1);
- At least one optical waveguides formed in a high aspect ratio hole that extends through the wafer (claim 1).

With regard to claim 92, US 6,198,168 does not disclose a layer of highly reflective material formed to line an inner surface of the high aspect ratio hole. However, US 6,198,168 discloses applying a coating of aluminum to hole by sputtering (claim 25). Aluminum is a highly reflective material and therefore, it is obvious to have a highly reflective material in the inner surface of the hole.

With regard to claim 93, US 6,198,168 discloses the optical waveguide is formed by an anodic etching that creates the high aspect ratio hole (claim 1).

With regard to claim 94, in addition to the limitations disclosed in claim 91, US 6,198,168 also discloses:

- A layer of highly reflective material in the inner surface of the high aspect ratio hole (see claim 92 above).

With regard to claim 95, US 6,198,168 discloses the highly reflective material comprises at least one layer of a metal (claim 23).

With regard to claim 96, US 6,198,168 discloses the highly reflective material comprises:

- US 6,198,168 discloses a layer of aluminum (claim 23);

Art Unit: 2814

- US 6,198,168 does not disclose a layer of tungsten is formed on the inner surface of the high aspect ratio hole. However, One with ordinary skill in the art would know that aluminum would react with silicon at low temperature. To circumvent the aluminum leaching, one would use a refractory metal such as titanium or tungsten to form a diffusion barrier on the wafer surface to be covered with aluminum. The refractory metal also serve another purpose, which is to laminate the aluminum to the inner surface. Therefore, it would have been obvious to one with ordinary skill in the art to provide a barrier metal such as tungsten. Doing so would stop the aluminum leaching into the silicon wafer.

With regard to claim 97, in addition to the limitations disclosed in claim 91, US 6,198,168 also discloses:

- A mirror-like layer including aluminum formed on an inner surface of the high aspect ratio holes (claim 23)

With regard to claim 98, US 6,198,168 does not disclose the mirror-like layer has a thickness of approximately 300 Å. However, one would choose a layer thickness to fit the high aspect ratio hole. This is merely a design choice.

With regard to claim 98, US 6,198,168 discloses the mirror-like layer is formed by a self-limiting deposition process, which is substitute aluminum for the polysilicon (claim 26).

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

*Conclusion*

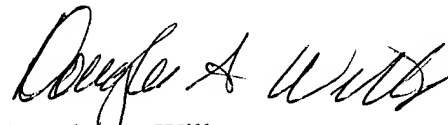
**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (703) 305-0474. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
Douglas A. Wille  
Patent Examiner

wsl

March 15, 2002

